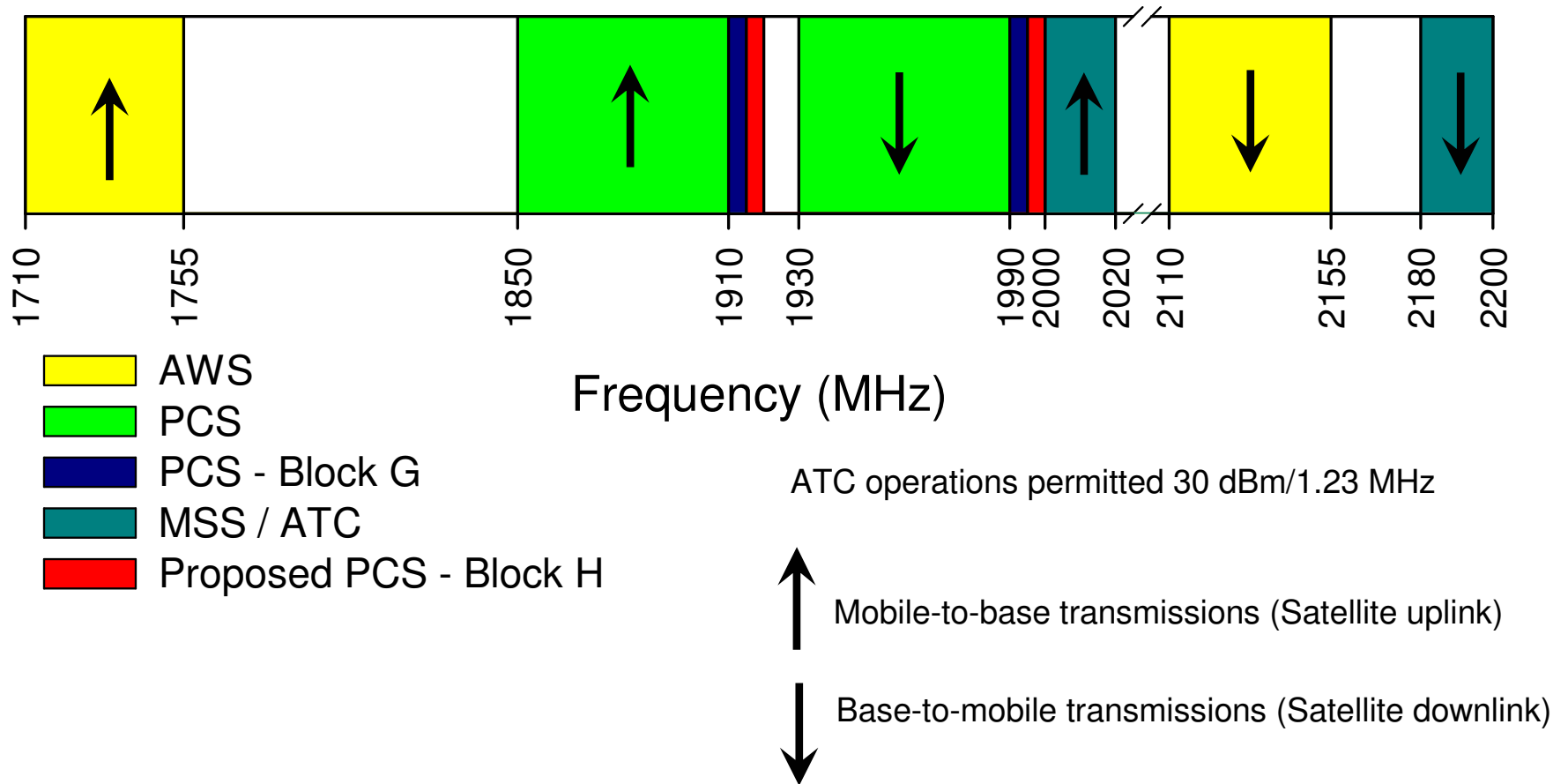


Spectrum Situation



FCC / Industry requirements for out-of-band emissions

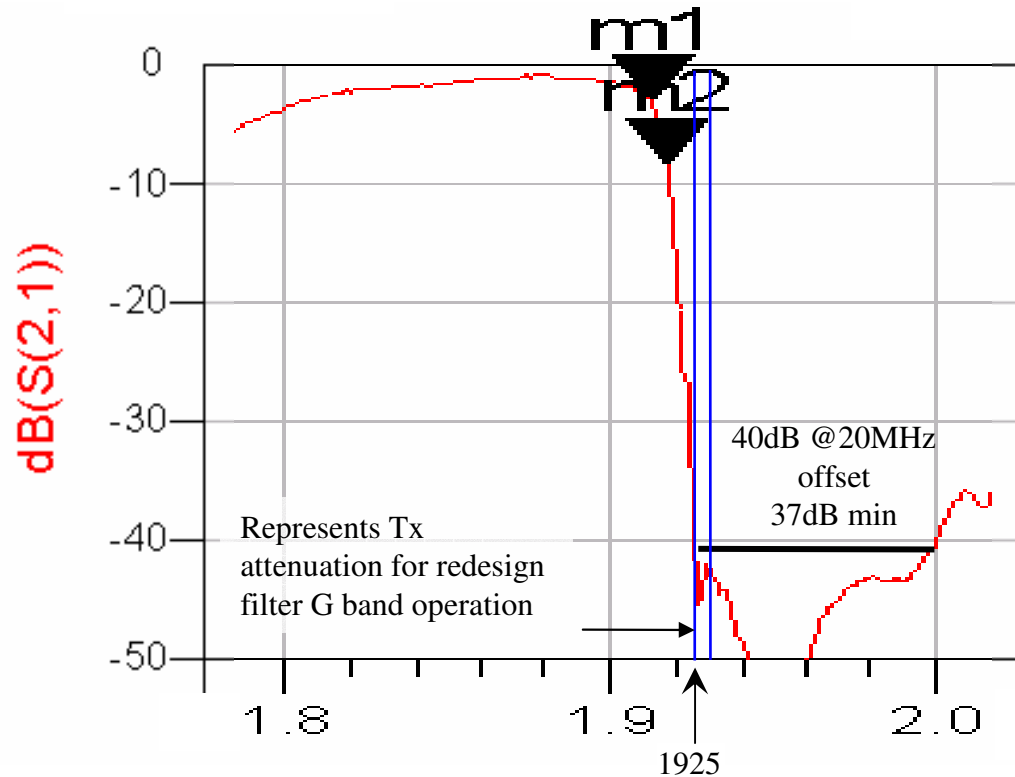
FCC Rules		
	dBm/MHz	
Broadband PCS	-13	24.238
Cellular	-13	22.917(a)
700 MHz	-13	27.53(c)(1)
(mobile into PS band)	-13	27.53(c)(4)
(Glonass/GPS)	-40	27.53(e)
2.3 GHz (WCS)	-50	27.53(a)(1)
(mobile into SDARS)	-80	27.53(a)(2)
MSS ATC – 1995-2000 MHz	-40 → -13	25.252(c)(2)
MSS ATC – below 1995 MHz	-40	

Industry Standards (into mobile receive band)		
	dBm/MHz	
GSM 400	-57	GSM 05.05
GSM 850	-69	GSM 05.05
GSM 900	-69	GSM 05.05
GSM 1900	-61	GSM 05.05
TDMA – 900 MHz	-65	ANSI 136-270
TDMA – 1900 MHz	-65	ANSI 136-270
CDMA – 800 MHz	-81	TIA/EIA-95-B
CDMA – 1900 MHz	-81	TIA/EIA-95-B

Industry protection requirements greatly exceed that found in the FCC rules

Transmit Filter Considerations

- Transmit filter characteristics currently have 5 MHz tolerance to meet attenuation requirements
 - temperature compensation and manufacturing tolerances
- Filter attenuation for G band 3 dB at center frequency
 - If not compensated mobile device would lose 3 dB in link margin
 - If compensated by higher Tx power, battery life reduced

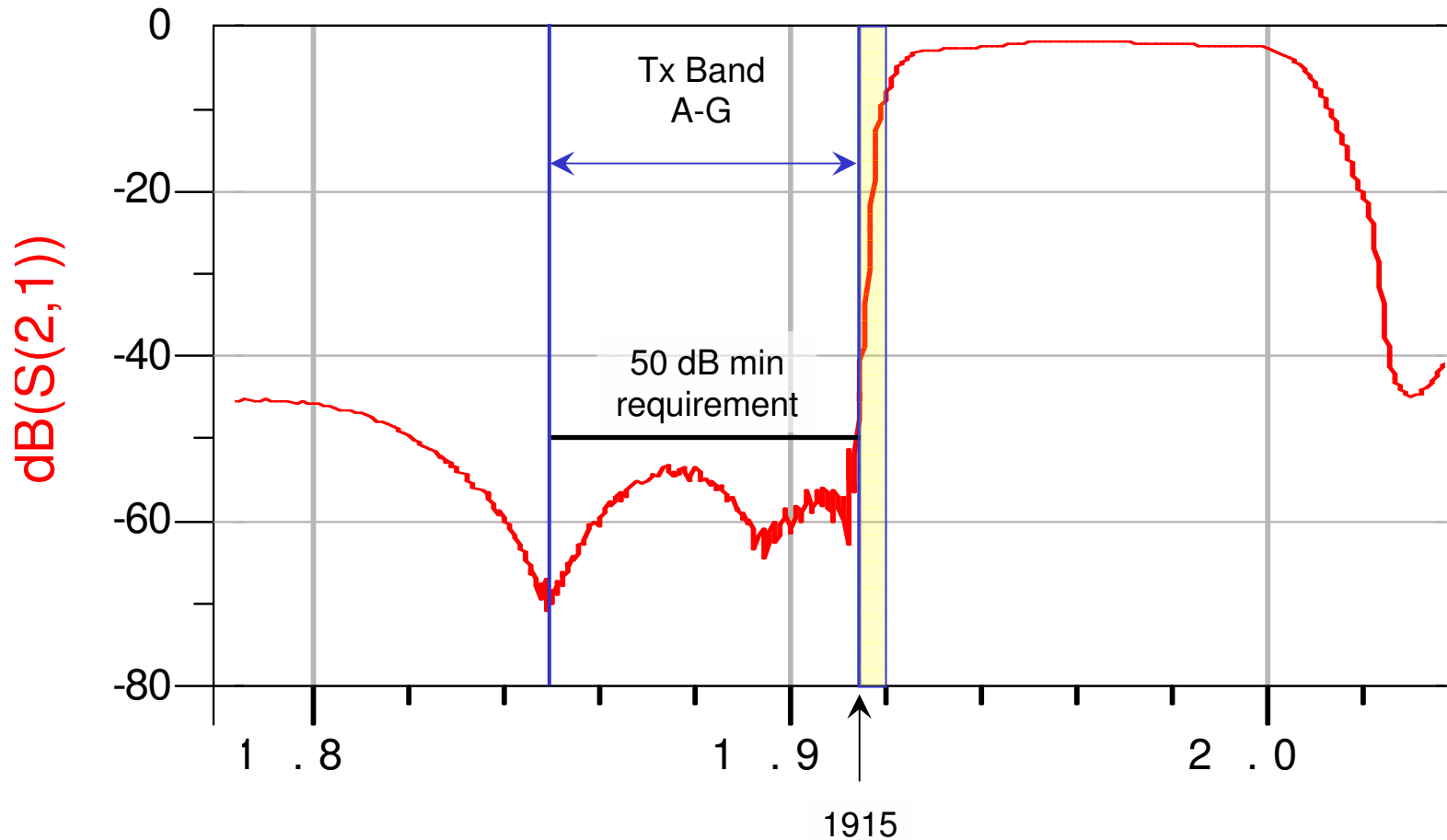


- Filter attenuation about 8 dB for H band Tx
- 37dB min can be obtained for G band in short term by sorting and possibly longer term can be supported with design change and new temperature compensation
- Risk since current data is a single sourced sorted filter
- Split band filters can solve duplex noise problem but not Rx noise from G band Tx's

m1 Freq = 1912.5 MHz
 $\text{dB}(S(2,1)) = -3.0021$

m2 Freq = 1917.5 MHz
 $\text{dB}(S(2,1)) = -8.4160$

Receive Filter Considerations



- Rx filter also needs tweak/sort with associated risk
- Split band filters possible for H band
 - but expensive option in cost and size
 - performance degradation due to extra losses with switches
- Need commercial design margins for G band

Impact on use of G and H band for broadband PCS mobile applications

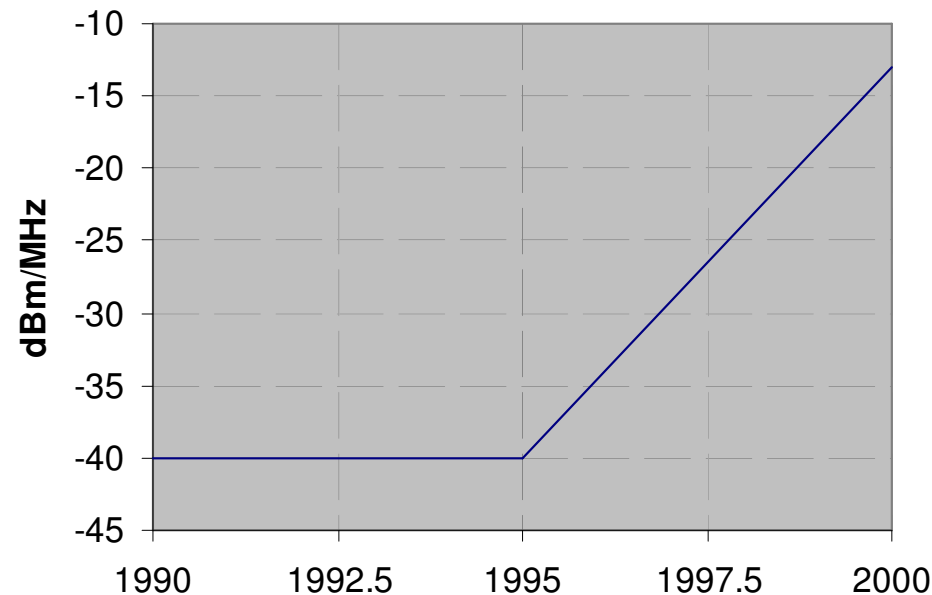
- A through G band
 - Single duplexer
 - Cautiously feasible
 - Split band Tx filter provides no help for Rx noise
 - Split band Rx filter can solve duplex problem but adds cost, size, loss
- A through H, or H band
 - No identified filter technology for limiting Tx noise to TIA levels in Rx band
 - Split band filters do not help reduce noise into Rx band
 - Motorola believes distances on the order of 1m is minimum required
- Conclusion
 - H band is not feasible at this time or near future
 - G band carries risk in filter feasibility and cost with single supplier identified
 - G band may require higher PA power due to filter losses
 - Motorola is not in favor of split band filter options (useful mainly for Rx)



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Adjacent channel issues with H-block



- Sharing in adjacent spectrum to MSS/ATC operations will be difficult
 - Primary concerns are interference from H-Block base stations into MSS/ATC base stations and from MSS/ATC mobiles into H-Block mobiles
 - Interference into H-block mobile receivers is significant
 - Guard band necessary to resolve uplink next to downlink issues
 - ITU-R DNR [IMT.COEXT] studies show 5-10 MHz may not resolve interference issues

Conclusions

- Feasible, but difficult to extend PCS band to create new “G” block with minimal cost / size / performance impact
- Extending PCS band to 1920 MHz is problematic
 - **Not feasible with single duplexer**
 - **Not clear if it will be feasible to filter as aggressively as required**
 - **Interference to MSS/ATC Base receiver and from MSS/ATC mobile transmitters will be problematic**